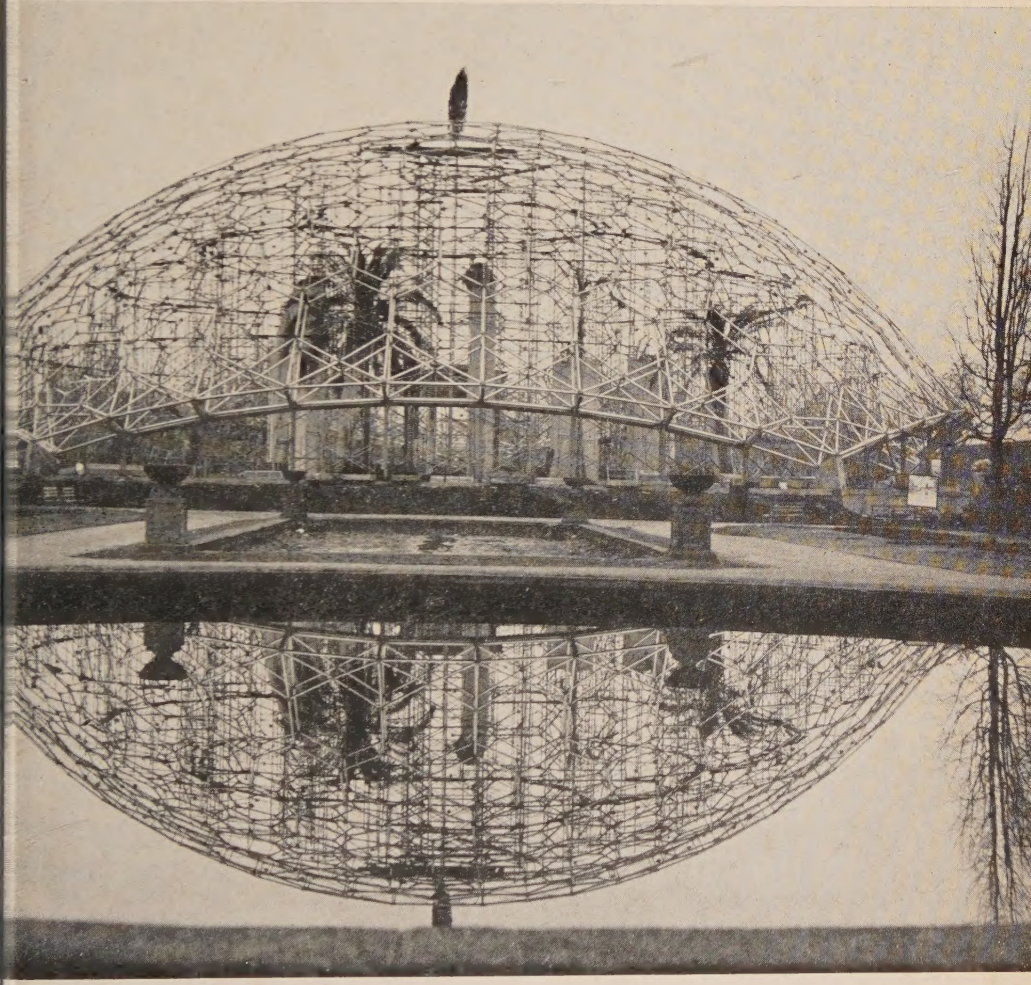
MISSOURI BOTANICAL GARDEN

Bulletin

March 1960
Volume XLVIII
Number 3



THE MISSOURI BOTANICAL GARDEN
CENTENNIAL YEAR 1959

COVER: The framework of the new Climatron as reflected in the center lily pool. Photo by Howard Vogt, *Globe-Democrat* Pictures.

The evergreen tree atop the new Climatron is a salute to an ancient construction tradition. About 1300 years ago the custom of using an evergreen tree to mark the "topping out" of a building was originated in Northern Europe. When attached to the ridgepole the tree announced the completion of the frame without accident. Other countries adopted the custom, though the tree was often replaced by such diverse items as a wreath with ribbons, a tree branch, bull's horns, a sheaf of corn, a bunch of flowers, a bright handkerchief or a flag—some of which were reputed to bring good fortune and protect the building from lightning or from evil spirits.

The new and very modern Climatron bows gracefully to this old tradition.

Office of publication: 306 E. Simmons Street, Galesburg, Illinois.

Editorial Office: Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis 10, Missouri.

Published monthly except July and August by the Board of Trustees of the Missouri Botanical Garden. Subscription price: $3.50 a year.

Entered as second-class matter January 26, 1942, at the post-office at Galesburg, Illinois, under Act of March 3, 1879.

Missouri Botanical Garden Bulletin

Vol. XLVIII No. 3 MARCH 1960

THE MISSOURI BOTANICAL GARDEN IN THE CENTENNIAL YEAR 1959

F. W. WENT AND HUGH C. CUTLER

THE plans for rebuilding of much of the physical plant of the Missouri Botanical Garden, announced in last year's report as essential for rehabilitation of this century-old institution, started to take concrete shape in 1959. This hundredth year of its existence was celebrated by the Garden in many different ways, but the major feature of the Centennial Year was undoubtedly construction of the first unit of the new greenhouses, the Climatron.

As mentioned in this report, the Fern and Economic houses, flanking the monumental Palm House, were physically in such bad condition that they could not be repaired further, and complete reconstruction was indicated. Even the Palm House itself would have needed such extensive rebuilding that its cost would have been prohibitive. And these houses, which were modern half a century ago, could certainly not have been sufficiently changed to make them acceptable by 1960 standards. Therefore the Board of Trustees made the decision to replace these three houses with a new structure, which should be the last word in greenhouse construction, and which should have at the same time a dramatic appeal to highlight the new policies of the Garden.

In considering all aspects of the reconstruction problem, Mr. Eugene Mackey of the Architect firm of Murphy & Mackey, which had been retained to do the planning of the new greenhouse, decided that a geodesic dome, as invented by Mr. Buckminster Fuller, would best fulfill all requirements. This structure is the most economical for a building unsupported in the center; it has the smallest surface for its volume, and it offers very interesting possibilities for enclosure and for growing space.

It was originally hoped that the new greenhouse could be erected so rapidly that it would be completed in time to protect the large palms which were left standing upon demolition of the old palm house. In spite of the fact that construction was speeded up as much as possible, factors beyond anyone's control delayed completion of the new greenhouse, of which the framework was already completed by January 1, 1960. When the old Palm House was torn down it was found that the steel beams were in much poorer shape than had been thought,

and that reconstruction of the old house would have been almost impossible without replacing every steel girder.

Originally it was intended to enclose the whole Climatron with plastic sheeting suspended from the alumnum framework. However, it was decided that such a plastic skin, although feasible, would not have been very durable using the presently available plastics, and therefore a completely new enclosure was designed, with triangular plexiglass panels mounted with neoprene gaskets in an aluminum framework. This will give a very high degree of light transmission, allowing, even in winter, a fair amount of photosynthesis in the plants growing inside. The light intensity will be at least double that which prevailed in the old Palm House.

The planning, to be modern, had to include air-conditioning of the new greenhouse and had to prevent the development of excessively high temperatures inside. In ordinary greenhouses the temperature can be kept down during summer only by shading, which defeats one of the main purposes of a greenhouse, namely, to keep plants in the strongest possible light. Cooling can be accomplished in several ways: by refrigeration and by evaporation. Since the Climatron is to house tropical plants, it is sufficient to cool the air by evaporation, which is the simplest and most economical way, although the temperature cannot be lowered under 80° F. in summer.

The size of the Climatron, larger than any greenhouse previously air-conditioned, posed several new problems never encountered before. With the aid of Mr. Paul Londe and Mr. Arthur Hess, a completely new principle was worked out for the temperature control of the Climatron. Instead of trying to maintain an even temperature throughout the 23,000 square feet of the greenhouse, which would have meant enormous ducts and difficult problems of air circulation, a deliberate temperature gradient is to be produced and maintained. The air, cooled or heated to the desired temperature through water sprays and a water curtain, will enter the greenhouse at the west end. The existing topoggraphy suggested a solution, by which the water curtain could be located in a number of bays under the concrete bandslab on which the geodesic dome was to be constructed. This meant that the exhaust fans had to be located on the east side of the building.

During night the Climatron will need heating, and this is to be accomplished by an entirely different and separate air circulation system, also producing a temperature gradient but this time from south to north. The existing tunnel for the heating pipes could be used as an air duct for the warm air, to circulate it through the whole greenhouse. In this way two different gradients will be maintained in the building, an east-west gradient during the day, and a south-north gradient during the night. The size of the greenhouse should make rather smooth gradients, and thus a number of different climates will be created and maintained. On this basis the

name of "Climatron" was selected for this greenhouse.

The structural and operational details of the Climatron are unique. Also its planting pattern is designed to be different. Instead of growing specimen plants, the intention is to grow several associations, such as an Amazonian jungle and a mountain rain forest. In this way the Climatron will not just be a display greenhouse, but it will also be used as a research tool, to study problems of tropical ecology, and to establish the optimal climatic requirements of many tropical plants.

In several other respects is the Climatron unique. In March, 1959, Mr. Mackey started to draw detailed plans of its construction. In May the plans had reached a stage when fairly accurate estimates of its cost could be prepared. The Trustees then made the decision to start construction immediately. New funds had to be collected, since the will of Henry Shaw provided only for funds for maintenance of the existing facilities. As these new funds became available in a wave of generosity of the Trustees personally as well as many business concerns and private citizens, precedented only by the original gift of Henry Shaw, contracts for demolition of the old greenhouses, for construction of the concrete base for the geodesic dome, for construction of the dome itself, for installing the plexiglass cover, for electrical installations, and for the heating cycle, were signed. Thus the building grew as the architectural and mechanical drawings were being completed, and as the funds were collected in a spirit of enthusiasm and faith in designers and providers, probably unequaled in building history. This is all the more remarkable because of the great complexity of the building, which under ordinary circumstances might have taken a year to design. But such is America—and especially St. Louis!

The summer and autumn months were exciting, as concrete and aluminum framework rose, and on November 19 a tree was attached to the top of the aluminum dome, indicating completion of the framework without any accidents to the workmen.

In the meantime much work was carried out by the Women's Association of Shaw's Garden in preparation for a Centennial Celebration which took place from September 26–October 4. The late Mr. Emil deLeuw coordinated their activities with the Garden operations, and by September an ambitious program of activities was lined up. The part of the Garden in the Centennial Celebration is mentioned separately; here only the activities of the Women's Association under Mrs. Kirkbride will be mentioned. It had been decided that a sales fair was to be held, and to this end four large tents were erected on the lawn east of the Shaw Tower Grove residence. One of the tents served refreshments, and was staffed from 10:00 A. M. to 10:00 P. M. Thousands of "hot dogs," cups of coffee, doughnuts and bottles of pop were sold to the visitors, who could sit under the big elm tree or on the lawn in front of the residence. In other tents a "White Elephant" sale drew thousands of people, buying anything from garden furniture to paintings.

Most articles for sale had been supplied free of charge by local firms and by private people, and were being sold by members of the Women's Association from 10:00 A. M. to 4:00 P. M. Also, rides through the Garden were available in Fiat cars loaned by a dealer.

In a special music tent, erected northwest of the Shaw residence, Miss Beulah Schacht had arranged for musicians to play and sing, both afternoon and evening. This was tremendously popular and it is evident that we should arrange for frequent outdoor concerts by small groups during the summer months, so that visitors may enjoy quiet music in harmony with the setting of a country garden of a century ago.

The Garden itself had also prepared for the Centennial. The lawns in the Knolls were better than they had been in years, through improved care. The water lily pools were beautiful. The rose garden was in full flower through proper care by the grounds crew and volunteer helpers who cut off the old flowers. The Linnean Garden was past its prime, but chrysanthemums and petunias still provided a lot of color. The flower beds along the water lily pools had been planted with colorful foliage plants, which in other years were used in the Italian Garden, now largely destroyed through building activities. And in between, gladiolus, donated by the Kroger Company, flowered. Perhaps most outstanding were the dahlias and chrysanthemums, which members of the Dahlia and Chrysanthemum Societies had planted in spring. They formed large masses of color along the Knolls.

It had been decided to keep the Garden open until 10:00 P. M. during the Centennial Celebration. This was so popular that almost as many visitors passed through the turnstiles at the main gate after 5:00 P. M. as were counted from 9:00 to 5:00, a good indication that, during summer, we should make a definite effort to have the Garden open at least several evenings each week. This means extra guards and proper night lighting, but obviously a large number of people like to come after work in the evening to enjoy an hour of quiet in beautiful surroundings. During the Centennial lighting was provided by 100 flares and about 100 oil wicks floating in small glasses, placed along the water lily pools.

The total attendance during the 9-day Centennial Celebration was 45,000 persons who entered through the turnstiles of the Main Gate, and an estimated 25,000 entering through the Cleveland Ave. Gate. Never during its entire history have such crowds visited the Garden. During the most active years of the Garden (1928–1938) only twice did a larger number visit it during a whole month (November, 1929 and 1934), but the Centennial attendance occurred during only a 9-day period, of which several days were so rainy that only the most enthusiastic garden-lovers came (during two nights there were tornado warnings). This shows that the Missouri Botanical Garden commands interest, and that the rehabilitation program is completely justified from a civic point of view.

During the Centennial there was an

exhibit of flower paintings by school children of the State of Missouri, held in the Museum. These paintings were sent in as the result of a competition and the quality of the art work was highly encouraging, so much so that we feel that this competition should become an annual event. In the three divisions, the prizes went to:

Class I—As the Artist Sees the Plant.

First prize—Annette Barkey, Jennings Senior High School.

Second prize—Rose Marie Bandl, Beaumont High School.

Class II—As the Botanist Sees the Plant.

First prize—Jerrily Rodden, Concord Lutheran School.

Second prize—Sylvia Treglown, Buder School.

Class III—As the Botanical Scientist Sees a Plant.

First prize—James Orton, O'Fallon Technical High School.

Second prize—Stephanie Stromdahl, Hamilton School.

On October 16–17 the now-traditional, annual Systematics Symposium was held. A total of 216 botanists and students from colleges and universities all over the Mid-West participated, and the discussions were as animated as usual. Discussion leaders were Dean Henry Andrews and Professor Bryan Patterson. The speakers discussed problems of Biogeography, both in general terms and specific cases.

The Tower Grove house of Henry Shaw, which had been partially restored in 1953 was, during 1959, brought back to its prime condition, and is now very much like it was in the days when Henry Shaw lived. there. The Board of Trustees appointed an Historical Committee, consisting of Mr. John S. Lehmann, Chairman, Mr. Henry Hitchcock, Mr. John Bryan, Mr. Charles van Ravensway, Mrs. Neal Wood and Mrs. Edwin R. Culver, which has been put in full charge of the Shaw House. Mrs. Culver and Mrs. Wood, with the special advice of Mrs. Fothergill Graves, were most active in the restoration. The dining room, which had been occupied by the Iris Society, was re-furnished after Mr. Benson of that Society moved into one of the second floor rooms. The third bedroom, which had been occupied by Mr. Evinger, was also re-conditioned, and the ground floor quarters were re-done, and Mr. Evinger now occupies that area. Many of the pieces of furniture were re-upholstered, and the whole house now gives the impression of care and quiet elegance, just as it must have done in Henry Shaw's day.

The restoration was completed just prior to the Centennial, and over 10,000 people visited the house during the 9-day period. The admission fee was raised from twenty-five to fifty cents for adults, children still being admitted free when accompanied by an adult. This increase did not seem to affect the total attendance.

Hostesses for the Shaw House were provided as in the past six years by the Eighth District Federation of Women's Clubs of Missouri. Ladies from the Women's Association of the Garden provided refreshments and acted

as hostesses for the Orchid and Chrysanthemum show previews.

In the years before 1953 the monthly attendance figures for the Garden were published in the BULLETIN. This is now being resumed, with the monthly attendance data for the last thirty-five years summarized in the following table, and the total yearly attendance shown in the form of a graph:

ATTENDANCE RECORD 1925 TO 1959

Shown in Thousands

	1925	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*	*1935*	*1936*
Jan.	7.4	23.5	9.4	16.8	9.3	13.8	27.4	30.2	29.1	11.4	7.3	10.9
Feb.	6.5	24.0	21.5	27.2	28.2	20.0	23.3	16.7	15.0	22.9	9.1	6.0
March	13.3	8.3	32.5	66.6	46.6	51.3	42.6	29.0	18.7	19.2	16.1	27.3
April	17.4	14.6	25.6	25.8	29.6	29.5	33.9	27.9	23.7	34.2	28.1	36.8
May	26.3	34.0	25.2	35.1	35.9	35.4	49.1	45.4	32.6	20.5	30.3	43.8
June	17.7	27.8	26.1	46.3	35.6	31.1	27.2	25.6	21.4	21.1	27.6	26.7
July	19.4	27.3	26.6	30.4	32.8	25.6	26.5	27.5	27.0	21.1	24.4	22.1
Aug.	41.6	32.4	31.2	42.3	43.9	34.9	38.5	33.9	35.6	25.9	31.1	32.6
Sept.	16.0	21.4	23.0	39.5	33.5	40.5	30.6	29.4	23.2	30.1	36.4	25.3
Oct.	15.7	23.1	20.4	38.4	35.2	38.6	40.6	42.8	27.9	47.0	28.3	36.7
Nov.	53.5	39.0	50.2	67.6	78.9	60.4	58.0	51.0	68.7	79.6	48.0	47.3
Dec.	5.7	11.0	12.9	32.0	14.1	11.8	18.9	10.8	29.1	15.5	16.3	22.1
YEAR	240.4	286.2	304.6	468.1	423.5	392.6	416.6	370.4	351.8	355.0	303.1	337.6

	1937	*1938*	*1939*	*1940*	*1941*	*1942*	*1943*	*1944*	*1945*	*1946*	*1947*	*1948*
Jan.	6.8	16.1	12.3	11.0	13.7	13.5	7.1	15.5	6.0	8.3	5.3	3.2
Feb.	22.8	35.8	29.2	15.4	16.5	7.8	13.4	12.3	12.8	13.0	18.5	11.6
March	33.6	28.0	18.4	24.4	16.1	17.6	10.4	7.4	12.8	20.4	12.0	15.5
April	21.1	32.8	27.2	20.7	28.1	23.9	18.6	22.8	25.6	27.1	25.8	18.1
May	52.6	42.0	38.2	42.3	40.7	31.7	26.3	20.1	23.1	25.2	33.6	26.2
June	32.9	33.9	23.0	31.5	31.5	22.1	14.6	17.5	14.7	22.1	21.6	17.6
July	35.6	30.0	29.1	29.6	34.0	23.0	17.1	19.8	18.0	21.8	22.3	19.9
Aug.	42.7	31.5	36.0	35.2	41.4	28.1	19.1	17.8	19.4	24.2	18.3	23.5
Sept.	31.0	27.3	25.6	32.6	32.4	20.3	15.8	21.7	21.5	44.4	19.0	20.3
Oct.	34.7	39.0	31.7	36.3	29.7	21.8	20.8	24.4	23.6	21.2	19.2	22.5
Nov.	59.2	50.3	46.7	41.0	37.4	24.1	30.0	25.5	36.3	37.2	32.7	25.7
Dec.	10.8	18.0	19.5	13.9	10.0	4.3	8.1	7.1	8.5	8.8	9.6	12.2
YEAR	384.0	384.6	336.9	334.2	331.4	238.2	201.8	201.9	222.3	273.7	235.7	216.4

	1949	*1950*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*	*1957*	*1958*	*1959*
Jan.	4.5	6.5	5.7	9.4	4.5	14.1	7.9	3.8	4.3	5.2	5.3
Feb.	17.0	10.2	13.6	14.9	20.1	12.9	7.4	7.5	10.1	13.4	12.1
March	9.2	8.1	14.4	9.0	10.8	4.9	14.6	14.2	19.1	15.3	25.6
April	23.0	20.2	17.0	26.1	18.8	21.0	15.8	29.1	23.0	25.0	25.8
May	28.2	21.9	25.9	27.3	22.6	28.9	11.5	22.4	24.3	26.6	25.6
June	17.6	22.2	16.6	26.7	14.7	17.9	8.9	18.3	18.6	25.4	25.3
July	19.2	29.1	19.6	18.2	20.6	18.0	13.1	20.1	22.1	25.5	27.7
Aug.	16.7	24.2	24.9	27.2	21.8	20.9	20.4	20.0	20.3	24.6	25.5
Sept.	28.2	18.9	21.7	23.4	16.1	18.6	21.2	19.8	23.9	23.2	37.3
Oct.	23.7	29.3	19.2	18.8	16.4	29.8	12.5	18.5	17.8	24.1	40.6
Nov.	29.6	18.2	14.8	35.7	27.7	14.0	15.9	15.9	19.2	23.3	22.5
Dec.	8.5	5.5	5.2	13.0	12.6	9.3	6.7	8.1	15.5	8.8	6.0
YEAR	225.9	214.4	198.6	249.5	206.2	210.3	155.9	197.7	218.2	240.4	279.8

We can learn a lot from these figures. We must assume that the interest in the Missouri Botanical Garden is reflected by the number of people visiting it. But there are obviously many other factors involved. For instance, when transportation became a problem during the war years, attendance dropped from an average 350,000 persons to a scant 200,000. Yet, when we draw a straight line through the attendance figures, we see that the declining rate of attendance, which started in 1930, continued after the war years, and indicated that, without drastic changes, by 1960, the number of visitors might have declined to a scant 100,000.

In reality, we see that in 1956, a recovery in the attendance has set in, approximately as steep as in the years 1925 to 1930, and that in 1959, this increase has continued. Actually, the number of visitors was very much higher than the actual count at the turnstiles at the Main Gate indicates, for the restoration of Shaw's Tower Grove House and the Centennial activities at the southern end of the Garden have drawn increasing numbers of visitors through the Cleveland Avenue gate. During the Centennial Celebration at least 25,000 visitors must have entered through the Cleveland Avenue gate, where there are no turnstiles, and practically all 3,000 children so graciously received by the Veiled Prophet Queen arrived through that gate.

The table shows that, while in the 1920's and 1930's attendance was irregular with peak months of up to 80,000 visitors, during the last years the attendance is much more evenly distributed over all months and that, except for January and December when, because of bad weather, usually less than 10,000 people visit the Garden, all other months had very regular attendance of twenty to thirty thousand people.

This is of importance in planning for the future. If we can keep attendance so evenly distributed, parking and entrance facilities will only have

to be based on top crowds on Saturdays and Sundays, and these top crowds are now more or less evenly distributed throughout the year, in contrast with the '20's and '30's, when the much larger Chrysanthemum Shows attracted crowds many times greater than during the rest of the year.

This indicates that with a proper distribution of shows and displays of outdoor materials, a steady attendance throughout the year can be achieved. It is hoped that our new facilities will contribute to that end.

The Executive Director spent part of the summer in the Southwest and in California in connection with ethnobotanical studies supported by a grant from the National Science Foundation. Dr. Thomas Whitaker from California worked with him at the Garden for several months. Dr. Cutler also represented the Garden at meetings of the Directors of Museums and Taxonomic Collections in Florida.

In the beginning of February the Director returned from a trip through South America, where he studied the vegetation of several regions, especially of the desert regions near Lima, Peru; the shrub vegetations of the Campos Cerrados in the State of São Paulo; the Caatinga in Ceará, and the jungle near Belém. In early June he was present at the garden party celebrating the 200th anniversary of Kew Gardens; in August he attended the International Botanical Congress in Montreal, where he received an honorary Sc.D. from McGill University, and in early November, he traveled to Czechoslovakia and Sweden for consultation about phytotrons. He also participated in phytotron discussions at the University of Wisconsin as well as at Purdue University. He had many speaking engagements:—Science Teachers Institutes in Austin, Texas; Las Cruces, New Mexico; Ann Arbor, Michigan; Vermillion, South Dakota; Fargo, North Dakota; and at our own In-Training Teachers Institute at the Garden. Furthermore, he lectured in São Paulo; Memphis; Rolla, Washington, D. C.; Montreal; Penn. State College; Lubbock, Texas; Prague; Stockholm; Columbus and Chicago, and on many occasions for service and garden clubs in St. Louis.

RESEARCH IN USEFUL PLANTS

EDGAR ANDERSON, Curator

The studies of statistical methods and graphic representation have been continued. In the Spring he taught his Washington University classes including "Field Botany". He participated in the Williamsburg Symposium in March. The Men's Garden Clubs of America presented him with an award of merit at their Cleveland meeting. During the Summer months he traveled to California, Alaska, Costa Rica, Colombia and to the Rocky Mountain Biological Station in Colorado in connection with his researches with useful plants. He spent the Fall semester as a fellow of the Center for Advanced Studies in Behavioral Sciences. He is now back in St. Louis to resume his teaching and research.

THE HERBARIUM

ROBERT E. WOODSON, JR., CURATOR

ACTIVITIES in the herbarium during 1959 were encouraging. Redecoration of the herbarium and work quarters was made possible by a grant from the National Science Foundation. Details of the renovation were planned in consultation with Mrs. Fothergill Graves, a well-known interior decorator of St. Louis and a devoted Friend of the Garden. With relatively limited funds, Mrs. Graves was able to achieve a startling effect with pleasing pastel shades upon the walls, some new furniture and the refinishing of some old. The purchase of absolutely the last additional herbarium cases capable of being crammed within our present quarters has been made.

The staff consists of Dr. Robert E. Woodson, Jr., Curator, Mrs. Barbara Mueller, Secretary, and Dr. George S. Bunting, assisted by Mr. James A Duke, Mr. Jack Wasinger and Mrs. Irene Buersmeyer. The grass herbarium is under the direction of Dr. George Van Schaack, who had the volunteer assistance of Dr. and Mrs. Frederick Comte. It should be pointed out that the entire staff, including the Curator, is on a *part-time basis* quite insufficient to cope with the growing work of our herbarium and barely able, despite their devotion, to keep abreast of incoming correspondence and exchanges. Many important families in the herbarium should be completely reorganized, but the necessary manpower is lacking. The herbarium of the Missouri Botanical Garden is one of the richest in the world, and upon the basis of available statistics is the fourth largest in the Americas. The housing for a herbarium of its size and standing is most inadequate and the care must be limited.

Many accessions of unusual interest were received by our herbarium during the year just ended. It is particularly gratifying to report continued exchanges upon a substantial scale with the vast and extremely active herbarium of the Academy of Sciences of the USSR in Leningrad. During the past summer the Missouri Botanical Garden cooperated with the Yale School of Forestry in a collecting expedition to Darién Province, Panama. The numerous specimens of this expedition will doubly enrich our herbarium through exchange with other similar institutions.

A significant development of the past year was the larger number of requests for loans which our herbarium received. This increase, which was approximately 40% over the previous year, may be construed not only as evidence of a greater general interest in taxonomic research at home and abroad, but is particularly testimony of greater esteem for the collections of the Missouri Botanical Garden.

Research in the herbarium has maintained its usual diversity. Dr. Woodson and Mr. Duke have continued their studies on the Flora of Panama under a grant which they hold from the National Science Foundation. Dr. Woodson also has continued his studies

of population structures in butterfly-weeds and of drug plants. Dr. Bunting received a National Science Foundation award toward a monograph of the genus Philodendron under the auspices of which he spent the months of November and December collecting in the Yucatan Peninsula. Dr. Dwyer has concentrated his research toward the preparation of manuscript on Papilionatae for the Flora of Panama. Dr. Dressler has pursued various topics in Euphorbiaceae and Orchidaceae. Dr. Dodge spent the year as a guest consultant for the Brazilian Government at the University of Recife.

Five graduate students of the Henry Shaw School of Botany of Washington University have conducted their research in the herbarium during 1959, Dr. Lorin I. Nevling, Jr., having received the degree of Ph.D. at the June commencement. Dr. Nevling recently has joined the staff of the herbarium of Harvard University, Cambridge, Mass.; his dissertation monograph of the genus *Daphnopsis* will be published in the November 1959 number of the 'Annals ofthe Missouri Botanical Garden'. Other graduate students and the topics of their research were: Henry J. Kaltenthaler (B.S., Pennsylvania University, A.M., Washington University)—Rubiaceae; William C. Burger (A.B., Columbia University, A.M., Cornell University)—Moraceae; Howard Pfeifer (A.B., University of Iowa)—Aristolochiaceae; Fuad Safwat (License in Biological Sciences and Education, Higher Teachers College, Baghdad)—various topics in the flora of the Near East.

Herbarium Records—1959

Specimens mounted: ca. 23,696 sheets
Exchanges sent: 1,300 sheets
Exchanges received: 3,529 sheets
Loans sent: 10,041 sheets
Loans received: 1,183 sheets
Approximate total specimens in the herbarium: 1,741,000 sheets.

LIBRARY

GEORGE B. VAN SCHAACK, Librarian
and Curator of Grasses

Much of the library effort in 1959 was devoted to continuing the rehabilitation program made possible by the National Science Foundation grant, reported a year ago. This grant, received in 1958, provided $60,000 for the herbarium and the library. Significant parts of the library program were binding of back-files, completion of back-files by special purchase, addition of book-repair equipment, shelf-checking and other 'housekeeping', photographic copying of the card catalogue and shelf list, and purchase of cases for these copies.

The card catalogue copy, still unfinished, will replace the old catalogue of 2″ × 5″ cards with photographic copies on standard size library cards. This will permit the future integration of standard cards such as those supplied by the Library of Congress, and will provide, as well, a card large enough for recording necessary bibliographic data. The shelf-list copy, also on standard size cards, will replace the

old style paper sheets of odd size, many of which, dating back to 1900, are not in usable condition. The shelf-list copy will be filed adjacent to the card catalogue where it may serve to some extent as subject reference, subject entries being lacking in the main catalogue. The old card cabinets will very conveniently accommodate the Torrey Index, purchased in 1959, which is printed on the smaller size card.

General housekeeping included the shelf-checking of several sections not checked for many years, the replacement of many hundreds of pamphlet covers, and the provision of slip cases for many score of rarer books either already with broken bindings or in fine bindings which should be protected.

Additions to repair shop equipment included a substantial guillotine, a lettering stamper and a large stapler. Acquisition of a contact copier will permit the rapid copying of material for interlibrary loan requests of only a few pages; the books will thereby receive less wear, and the fees obtained will cover the expense involved.

Among many special purchases of books were included the fine 1935 reproduction of the *Herbal of Pseudo-Apuleius*, Dunthorne's *Flower and Fruit Prints*, and the third edition of Evelyn's *Sylvia*, 1689. The last-named filled the gap in our otherwise complete series of the first five editions. Journal files completed included Planta (17 volumes) and the Proceedings of the Linnean Society (18 years). Our copy of the Map of Hispanic America was completed as far as possible by the purchase of 47 sheets.

In addition to the normal accession of some 600 journal volumes, 202 books were catalogued. Some 958 books were returned from the bindery, and over 200 prepared for binding.

Of several gifts to the library one of nearly $500.00 deserves special mention because of its character. The gift was made up of donations in honor of the birthday of one of the Friends of the Garden. The money will be used to repair and replace fine bindings on some of our old and rare books.

The library participated in the celebration of the Centennial of the Garden by preparing an exhibit of over 50 of our illustrated volumes. The City Art Museum graciously provided a gallery where, during November, these volumes were on display, arranged to show the history of various techniques in making flower prints during the last 500 years. An illustrated catalogue of the exhibit prepared by the librarian and Erna Eisendrath constituted the final number of the BULLETIN for 1959.

EDUCATION

CLARENCE BARBRE, INSTRUCTOR
JOSEPHINE DAVIES, ASSISTANT IN EDUCATION
KENNETH O. PECK, IN CHARGE OF VISITORS' ACTIVITIES

A PROGRAM of activities for children from 7 to 18 is given every Saturday morning from 10 to 11:30 A. M., no admission charge or registration required. These programs were very successful in 1959 and 460 chil-

dren took part. The more active programs, like making Christmas decorations, planting miniature gardens and potting bulbs to take home, attracted large numbers. The attendance throughout the year was remarkably steady except during the summer vacation period and the colder days of fall and winter. Some high school biology instructors give extra credit to students who participate in the Saturday program.

The Pitzman Nature Program for the second year offered four courses in the natural sciences, at both junior and senior levels, covering birds, animal and insect enemies, trees, and other plants. There were 365 registrations for the two 5-week sessions and 245 children completed work for certificates. As a part of the Pitzman Nature Program, one group of children from each session was chosen to form a Junior Research Team. Under the guidance of Mr. Peck, Miss Davies, and Miss Beth Andrews, summer assistant in Education, they completed research projects on lawn weeds and the kinds of oak trees in the Garden. A report of their work was published in the September BULLETIN. Displays the groups prepared were exhibited at the Main Gate. Mr. and Mrs. Earl Hath, Miss Jeane Stern, Mr. and Mrs. Stuart O'Byrne, Miss Helen Bowman and Mr. Harry Licht, members of the St. Louis Audubon Society, conducted the groups in bird study.

In October nearly 800 children from local schools visited the Garden to plant paperwhite Narcissus bulbs. Each student was given a short period of instruction on what bulbs are and how to grow them. Each potted two bulbs which could be taken home.

About 90 tours were given to groups of children and adults. The tours varied in scope according to the interests of the particular group. An encouraging number of teachers are bringing their classes to the Garden where they can study the excellent materials we have to offer.

For many years Mrs. Paul Britt has directed the Volunteer Guide Service for the Garden. Groups of people

Children enjoy trip through North American tract to collect study material.

from all over the country, local organizations of adults and children, and many school groups have been guided through the Garden by Mrs. Britt and the ladies who have been specially trained in her organization. Their help makes it possible to conduct many more groups than our limited staff could handle. They do it so well that we receive frequent letters of praise for their work.

The Tree Trail continues to be very popular and last year about twelve thousand people followed it with the free guide-pamphlet which is given to visitors at the Main Gate. A new Nature Trail which will show the relations of plants and animals to their environment is being developed. It is designed to stimulate thinking of the relationships of man and with all other organisms.

Adult courses in Spring and Fall Wild Flowers, Botany for Home Gardeners, Grounds Care, Horticulture, Orchid Growing, Bulb Forcing and Plant Propagation were offered in 1959 and enthusiasm of the students was high. Clarence Barbre's Plant Propagation and Spring Horticulture courses had 160 students and Gillespie's Modern Horticulture for Home Gardeners, offered for the first time last year, was filled nearly to capacity in both Spring and Fall sessions.

ORCHID COLLECTION

R. J. GILLESPIE, IN CHARGE OF ORCHIDS

ROUTINE work as usual occupied most of the time of the Orchid Department during the year of 1959. The entire collection is now adequately potted and the cultural condition of the plants is greatly improved. Almost all of the cultural set-back due to the transfer from Gray Summit has been overcome.

An evaporative-pad cooling system was installed in the "New Introduction" house and was used during the warm months. The temperature of the house was held 10 to 15 degrees below the outside temperature, thus helping the newly introduced plants to become established. This was the first cooling system to be installed in any of the greenhouses in the city Garden.

A system of automatic watering with rain-jets was installed in 4 of the Orchid houses and gives an excellent drop-type precipitation. It is hoped that the entire collection will be watered automatically by the end of 1960.

For the annual Orchid Show a simulated room was designed, displaying orchids in 4 picture windows. A basement Orchidarium, using artificial light, was designed and built to demonstrate basement orchid culture. An Orchid Garden and several other displays, including one staged by the Orchid Society of Greater St. Louis were also featured.

During the Centennial Flower Festival the Orchid Department exhibited a tiered circular staging, massed with Cattleya hybrids. An artificial "Orchid Tree" was designed and built for the show. It was planted with numerous "botanical" orchids and plans are

underway to build several additional "Orchid Trees" in the coming year.

A continuous display of Orchids was maintained throughout the year in the alcoves and in the "Botanical Orchid" House. During the year the display areas were enlarged and made more elaborate by adding a Cattleya staging at the entrance of the "Bromel House" and also by placing several shadow boxes in the existing display areas.

Cut orchids were supplied weekly for flower arrangements in the Shaw House. As usual, flowers for the traditional "Queen's Bouquet" were supplied during the month of October.

Accessions

The year 1959 was the most active year in over a decade for new introductions into the orchid collection. A total of 1012 new plants were acquired during the year. By far the majority of these were"botanicals" from Central and South America. However, the hybrids were not neglected and a series of new hybrid introductions added considerably to our collection. Notable among these was a collection of hybrid Cattleya, Miltonia, and Paphiopedilum donated by Mr. George Butterworth of Framingham, Mass. Another valuable accession was a collection of modern hybrid Cattleyas acquired from the B. O. Bracy Co. of Santa Ana, Calif. Among the "botanicals" the most notable accessions were the plants received from Mr. C. H. Horich of Costa Rica. Numerous rare and unusual "botanical" species were received from Mr. Horich and these plants, along with other newly acquired "botanical" orchids, establish the collection as having more Genera and Species at the present time than at any other period in its history.

Research and Instruction

Four orchid courses were given by the Garden during the year. Two of these were all-day courses and the others were three hours each. These courses were well attended and are being offered again in the coming year. An experiment to test orchid potting media was set up under the direction of Dr. Went. It consists of 4 blocks of Cattleya × Mrs. John Lehmann potted in various potting media. This experiment is still in progress and will be concluded in 1960.

Several articles were published by the Orchid Department during the

Illustration of an Orchidarium such as an individual might construct for his basement.

year in national orchid publications. These articles dealt with such topics as orchid culture and orchid hybridizing. The February issue of the Missouri Botanical Garden BULLETIN was also devoted exclusively to orchid culture.

MID-AMERICA ORCHID CONGRESS

In October the First Mid-America Orchid Congress was held in St. Louis at the Community Federal Savings and Loan Assn., St. Ann, Mo. The Orchid Department participated in the congress in a number of ways. A display depicting 50 years of orchid research at the Garden was built and staged. Orchid staff personnel were active as judges, panel moderators, and speakers. After the congress and show were over, Community Federal Saving and Loan Assn. presented to the Garden a display arch, which they had constructed as a show prop, to be used in future Garden displays.

PLANT INTRODUCTIONS

E. L. EVINGER, HORTICULTFRIST

THE active introduction of new materials for the outdoor garden has been temporarily held up pending the implementation of the new master plan. Nevertheless some fifty to seventy-five new species were incorporated into the garden in places unlikely to be affected by any physical changes in garden design. Many of the plants of an easily replaceable nature that were being grown for the outdoor garden were released through the plant sales booth at the Centennial Celebration.

Some twenty new lots of seed and cuttings were received and about seventy-five entries of small plants were made during the season. These will be grown and held in the greenhouse or nursery pending the time the garden will be ready to receive them.

The Experimental Greenhouses have been utilized this past season to grow nearly eighty kinds of tropical plants, mostly trees, for use in the Climatron. These are primarily from seed brought back by Dr. Went from his South American travels, and include many spectacular tropical flowering trees.

GREENHOUSES AND CONSERVATORIES

LADISLAUS CUTAK, HORTICULTURIST
AND GREENHOUSE SUPERINTENDENT

IN anticipation of tearing down the Palm House and its wings, our workmen began digging up the plantings as early as April and transferring them into tubs. It was hoped that most of the larger trees and shrubs in the houses scheduled for demolition could be left intact, but when the wrecking crew arrived to begin tearing down the buildings, we decided to employ all available Garden help to save as many of the plants as possible and move them to the Old Citrus House where trenches were dug and the plants heeled-in. Most of the material is doing rather well and will

no doubt stand another transplanting when the Climatron is ready to receive them. Pring Landscapers helped with their heavy equipment to move the tallest palms and the transplants would likely have taken hold had not sudden early freezes caused their demise. Protection covers were hastily assembled over others but these, too, are feared lost. The trunks which remain will be used later on to display epiphytes.

The waterlilies, which have won world-wide acclaim, were enjoying one of their best years, producing lovely riotous displays of color throughout the summer and autumn months. The front pools were fertilized and plowed on April 7th and actual planting of waterlilies began on May 6th. The plants took hold almost immediately and soon were producing flowers in abundance. Waterlilies are started from tubers in greenhouse tanks in January, pricked off and transplanted as needed, and before they are set outdoors make a lovely display in the green houses where visitors can watch their development from seed or tuber to flowering plant. The waterlilies are propagated by Mr. Frank Korte, who has performed this task for many years. The waterlilies in the outdoor pools kept on blooming through the month of October but on November 3rd were finally removed.

The cacti and succulents came into their own on several occasions during the year. During the whole month of July an excellent display of these plants was staged in the Flower House by the Henry Shaw Cactus Society in cooperation with the Garden. The Cactus and Succulent Society of America held its eighth biennial convention in St. Louis, July 7 to 11, and many commercial growers sent exhibits. After the show the plants were donated to the Garden's collection. Noted exhibitors were Johnson Cactus Gardens, Beahm Gardens, Gates Cactus and Tegelberg Cactus from California; Karr Cactus from Colorado, Desert Botanical from Arizona, and Siesta Cactus Gardens from Florida. Local members also had meritorious displays such as those of Carl Snyder, Harry Hoettger, the Stampehls, Al LePage, Zee Young and Bill Fischer. The July Show marks the first time that any individual society attempted a month-long exhibit and it proved a success. During the Centennial festival in late September another cactus display was shown in the Flower House. This was also the first time that the three greenhouse departments combined their talents and resources to put on a rather pleasing show with the flavor of a three-ring circus. Thus cacti, orchids, bromels and bedding plants were utilized to produce a harmonious show.

Potted cacti, which since 1933, were kept in back of the Cactus House for convenience were removed to the Seedling and Introduction House in the Exotic Range where they can be more easily and readily managed under present conditions. A number of natural trees and stumps were planted with bromels and exhibited in the Orchid Show in February and also in the Centennial Show in September. The bromels in the flower, especially *Tillandsia cyanea* and

Vriesia "Mariae," evoked much comment and, strange to say, drew some attention away from the flamboyant orchids. Some of these prepared bromel-studded trees will be used in the Climatron when completed.

As usual, novel requests coming to the Garden were fulfilled; among these the supplying of palm leaves for Muny Opera's production of "The King and I" in Forest Park, decorating the Khorassan Room of Hotel Chase for the Veiled Prophet Ball, furnishing plants and facilities to photographers and artists, as well as to radio and television stations.

FLORAL DISPLAYS DURING 1959

PAUL A. KOHL, Floriculturist

In early January tulip bulbs were potted and placed in coldframes. These were brought to the greenhouse in February for later use in the Easter display. In mid-January the poinsettia show was replaced with an arrangement of Primula obconica and Primula malacoides. This display was later included in the orchid show which opened with a preview on February 5. The orchid show was planned to simulate an orchid fancier's living room with doors opening into the garden. Orchids were displayed in windows and in the adjoining garden plants were arranged in the manner a grower would place them outdoors during the summer months.

KMOX-TV's mobile unit "On Location" produced a thirty-minute broadcast on the orchid show on February 7 and on April 4 covered the spring flower show.

From March 7 through the 15th the Greater St. Louis Outdoor Living, Flower, Home and Boat Show was held in the Kiel Auditorium. In this show the Garden staged a picture display of garden activities surrounded with groups of azaleas, genistas, cinerarias, narcissi and orchids.

The Easter display which contained fifteen kinds of flowering plants was completed on March 20. To mention a few, there were azaleas, cinerarias, genistas, marguerites, nasturtiums, lilies and at the north end of the display, a Dutch garden of daffodils and tulips. This was the largest display of tulips on exhibition in recent years. On April 11 and 12 the third annual daffodil show occupied the north end of the flower house. One hundred and seventy foliage and flowering plants were taken to Christ Church Cathedral and arranged for the annual Henry Shaw flower sermon April 26. The seventh annual African Violet Show used the flower house May 2 and 3. Dr. John C. Wister lectured on daffodils, iris and peonies to 200 members and friends of the St. Louis Horticultural Society in the Floral Display House May 4th. Pelargoniums were displayed for the week of May 5th, and on May 16 and 17 the St. Louis Horticultural Society held its spring flower show. This was followed by a display of hydrangeas and on May 23 and 24 the Rose Society of Greater St. Louis held its annual show.

During July a cactus display occu-

pied the flower house. On August 8 and 9 the Illinois Gladiolus Society held its annual show. Caladiums were then displayed and in late September were replaced with a special exhibit for the Centennial Celebration. This display was divided into three sections: one for colorful foliage plants; a grouping of cacti and succulents; and the third was devoted entirely to orchids. For the first week-end of the Centennial, September 26 and 27, the Dahlia Society of Greater St. Louis held its show on the balcony of the flower house and in the corridor along the orchid alcoves in the aroid house.

At the time of the Centennial a model of the geodesic dome and plants from the Garden were set up at St. Louis Lambert Airport and attracted much favorable comment. It was returned to the Garden December 9 and placed on the balcony of the flower house.

In late September the Garden donated foliage plants to the Academy of Science of Greater St. Louis for its opening celebration September 29. The Garden loaned palms to the Chase Hotel for the Veiled Prophet supper on October 5. The Queen's bouquet was exhibited on October 7 and a duplicate bouquet on October 11. The sixth Systematics Symposium and Luncheon was held in the flower house on October 16. Our palms were used in the City Art Museum to enhance the Garden's display of flower prints from October 30 through November 26.

The annual chrysanthemum show opened with a preview on November 5. The display contained a colorful collection of cascade chrysanthemums and particularly noteworthy was a large group of Japanese spider chrysanthemums representing fifteen varieties which were sent to us by the Longwood Gardens of Kennett Square, Pennsylvania. The Christmas show of poinsettias, chrysanthemums and peppers opened December 11.

Small-flowered cascade and new Japanese spider chrysanthemums from the Longwood Gardens recently introduced by the United States Department of Agriculture.

MAINTENANCE

MAINTENANCE of the physical operations of the Garden were divided between the Engineering and the Grounds departments early this year, The mechanical work having to do with heating systems, water, sewer, general plumbing, electrical and motorized equipment in the one department; while all other operational activities are under the Grounds Superintendent.

ENGINEERING

KENNETH SMITH, ENGINEER

THIS Department under the supervision of the Engineer and the Assistant Engineer James Hampton performed the usual efficient maintenance and repair work. Sometimes this required much time, patience and ingenuity incident to old, out-moded and worn facilities.

The removal of the old Palm, Economic and Fern greenhouses preparatory for the new Climatron created a number of problems of salvage, moving of steam, electrical, water and sewer connections.

Special or new work included wiring of the Orchid ranges for fans and water connections to provide for both cooling and automatic watering systems. A Catalytic burner installed on a trial basis in the Experimental Green house required considerable detail study and work of installation.

The Centennial Celebration brought numerous vexing problems of temporary wiring for lights, heaters, sound, and their maintenance during the period.

GROUNDS

LOUIS G. BRENNER, ARBORIST AND GROUNDS SUPERINTENDENT

THE effectiveness of the rehabilitation program for the grounds, inaugurated some 5 years ago, became decidedly apparent during 1959, a year of bustling activity for the grounds crew faced with the task of grooming the 70 odd acres of the Garden in preparation for the Centennial Celebration in October. Removal of the many weedy and duplicate trees of poor quality, large scale use of mulches, redesign of shrub and perennial beds, and use of power tools have been important factors in streamlining care for the outside grounds, making it possible for a small crew of men to perform reasonable maintenance with minimum of man-hour effort. This program has been so effective that the grounds crew was able to undertake additional tasks connected with the Centennial Celebration and construction of the Climatron without sacrificing the overall appearance of the grounds.

The 70 acres of the Garden, painting and carpentry work on interior and exteriors of buildings is maintained by a regular crew of 8 men including Joe A. Baker as foreman of the Grounds Maintenance Crew and Jess Mayhan as Painter-Carpenter. During the summer, with the heating plant shut down, two of the firemen are temporarily assigned to the Grounds and Maintenance Crew.

Winter and early spring months found the crew busy removing a few remaining trees of poor quality, a practice which has accentuated the splendor of the many fine old specimens growing on the grounds. Having removed many such weedy species in past seasons it is now possible to direct more effort toward specific maintenance of remaining specimens. Similarly considerably more time was devoted toward maintenance of shrubs. Important care of these woody plants includes proper pruning in season, and widespread use of wood-chip mulch which provides excellent soil protection, maximum benefit of fertilizers as well as reducing the many hours of laborious hand weeding.

Lawn areas show considerable improvement over preceding years. Coupled with a moist cool spring and early summer, a wet fall and rather mild forewinter, they reflect the attention toward reseeding given during February and early March. Widespread use of power equipment for application of herbicides has given good control of most noxious lawn weeds at low man-hour cost.

Early spring found the men busy cleaning out the marsh meandering through the west side of the Knolls. Here the drainage became poorly defined causing an expansion of the marsh area, a problem to maintenance of lawns in the surrounding area. The drainage was deepened thus lowering the surrounding water table and at the same time much of the weedy marsh growth was reduced making room to add other attractive marsh plants such as cardinal flower *(Lobelia cardinalis)*, marsh mallow *(Hibiscus moscheutos)*, lizard-tail *(Saururus cernus)*, and water willow *(Dianthera americana)*. Clearing of the marsh has had further benefit in making an excellent watering and bathing site for song birds, providing a popular locale for summer nature class instructors to bring classes for instruction in bird habits and identification.

While a portion of the crew were engaged in altering the marsh in the Knolls others were busy resodding the walk edges in the Linnean and Rose Gardens with sod cut from a remote corner of the garden. Though this operation consumed many long man hours it has made it possible to mow these turf borders in less than ¼ the time required in preceding years. Such turf borders had built up over the years with soil dropped from the roots of weeds until they stood above the level of the walks. The high crown of these sod borders made mowing difficult and time consuming.

The Centennial Celebration planned for October required Spring and Summer preparation. Special beds in the Knoll area were prepared for mass plantings of chrysanthemums and dahlias by volunteer efforts of the members of the St. Louis Chrysanthemum Society. Abandoning the Italian Garden, because of construction of the Climatron, made it possible to put more labor effort into caring for the Linnean Garden, plantings along the tropical lily pools and the mum and dahlia plantations in the Knolls.

The Rose Garden has continued to be an outstanding attraction of the grounds and presented a multitude of

brilliant blooms during the 1959 season. New rose introductions, supplied by commercial growers prior to sales release, have aroused increasing interest among visitors, many of whom now make regular visits to observe and evaluate these handsome introductions. The low maintenance schedule for the Rose Garden has proven sound and practical. Having a heavy mulch on the ground year round, the plants are not hilled in winter. In mid-November the canes are screened from winter sun with light covering of coarse hay, or evergreen branches if available. Use of high pressure spray equipment designed for shade and orchard tree protection has given superior protection from mildew and black-spot in the Rose Garden when a fog spray is used. No damage to the plants has been experienced in using this equipment and complete protection is obtained if a regular spray schedule is adhered to.

The crew has taken an active interest in the construction of the Climatron and has contributed considerable effort toward the success of this outstanding achievement. Grounds men supplied a large portion of the labor required to remove and store plants from the Palm, Fern, and Economic Houses prior to wreckage. They were also active in salvaging many usable materials during wreckage of these buildings.

Concerted efforts of the newly formed Historical Committee to complete restoration of the Henry Shaw Country Home in time for display during the Centennial Celebration required numerous hours of labor in moving furniture when rooms were papered and painted. Grounds crewmen cheerfully applied themselves to this task requiring patience and extreme care in handling the many fine pieces of old furniture on days of sweltering August heat.

It was natural that the grounds crew play an important role in the celebration of the Garden Centennial for which it was necessary to move many tables, chairs, benches and other properties to arrange the various attractions. The sales booth area on the lawns of the Shaw residence required daily service to remove rapid accumulations of trash and refuse. Principal areas of the Garden grounds required similar additional maintenance during this period.

Early in the year carpentry and painting maintenance of the Garden buildings was separated from the Engineering Department and assigned to the Grounds Department for supervision. In addition to routine maintenance of buildings and greenhouses during 1959 the exterior of the Linnean House was enhanced with a fresh coat of paint. Before painting, however, it was advisable to replace many window sills that the building be kept weathertight and to minimize heating costs. Working in the same vicinity trellis work in the Linnean Garden was repaired and painted. During the summer the entry to the Floral Display House was also repaired and painted thus improving the aspect of the many fine floral displays offered to the visitors.

INFORMATION CENTER

Mr. George Pring, Superintendent, and Miss Isabella Powell, Friends of the Garden secretary, maintained our Information Center at the Main Gate, Miss Powell answering questions, selling books and pamphlets which tell about plants, and doing all the secretarial work connected with the Friends of the Garden.

Mr. Pring answered numerous requests for expert information, appeared on television and radio programs and gave a number of lectures. He visited Longwood Gardens as a Consultant for their new waterlily pools. Many new books and pamphlets are now available and the number of people who come to the Information Center for special publications on plants is increasing.

ARBORETUM

FRANK L. STEINBERG, Superintendent

The Arboretum continues to be managed with a skeleton crew, yet the roads have been kept open, the grasslands managed and pruning and clearing continued. The area about the Pinetum Lake is open to cars daily and for six weeks in April and early May, the longer drive past the dogwoods, redbuds and many drifts of naturalized daffodils to the trailhouse and the wildflower trails was kept open.

Mowing required 631 tractor and man hours. The Pinetum was mowed in the late spring and again in the fall. All planted groups in the Pinetum were cleared of brush and sprouts, and dead trees were removed. All of the groups are clean and this should help to show off the narcissus display in the spring. Mowing 120 acres on the farm requires 108 tractor and man hours.

New furnaces were installed at the Gate House and the Diener residence. Minor repairs were made and some painting done at the Steinberg and Brenner residences.

PUBLICATIONS

ROBERT L. DRESSLER, Editor of the Annals
E. L. EVINGER, Editor of the Bulletin

Volume 46 of the Annals included one fascicle of the Flora of Panama, by R. E. Woodson, Jr., and Collaborators; papers by C. K. Dodge, Lichens of Africa; The Genus Daphnopsis by L. I. Nevling; and several shorter papers.

The first four numbers of Volume 47 of the Bulletin were edited by Evelyn Barbour and the last two by Virginia McMahon. Beginning with Volume 48 number 1, 1960, the Bulletin will be published ten times a year with E. L. Evinger as Horticulturist and Editor.

MISSOURI BOTANICAL GARDEN PROGRAMS

SPECIAL Shows and Displays:

African Violet Show, March 5 and 6

Daffodil Show, April 8 and 10.

Easter Display, April 17.

Free Nature Programs for children, aged seven and over, are held every Saturday morning from 10:00 to 11:30 A. M. Museum Building.

The Life Secret of a Plant, March 5.

The Story of the Pin Cushion Forests, March 12.

Make Your Own Dwarf Gardens, March 19.

Color Sound Movies, March 26.

Sowing Seed for Your Garden, April 2.

Flower Shapes and Names, April 9.

Hunting for Hidden Flowers, April 16.

Spring Safari, April 23.

More About Your Garden Seeds, April 30.

Free summer programs of nature study for children are supported by a gift from the Pitzman Foundation. Trails, craft-work, and group activities are offered. Schedules of these programs may be obtained in June at the Main Gate.

COURSES

The following courses are open to any interested person. Certificates are awarded upon the successful completion of any course.

Information on registration may be obtained by calling FRospect 6-5567

Please send all registration fees to

Missouri Botanical Garden
2315 Tower Grove Avenue
St. Louis 10, Missouri

Registration fees cannot be refunded after the last day of registration for any particular course.

The courses will meet in the classroom of the Garden's Museum Bldg.

To reach the Museum, enter the Garden through the walk-in gate opposite Cleveland Avenue at 2221 Tower Grove Avenue. The building is on the left.

BOTANY

Course 101. Spring Wild Flowers of Missouri.

Place: Museum Bldg. *Time:* Five Monday nights, 7:30 to 9:30 P. M., starting April 11. *Fee:* $15 for the five sessions. *Enrollment:* Limited to 18 students. (Additional sections will be opened if necessary.)

The aim of this course will be to teach basic flower terminology and use of Steyermark's "Spring Flora of Missouri" by examination of as many different species of native plants as possible. At least one class meeting will be a field trip to the Garden's Arboretum at Gray Summit on a Saturday afternoon. The flowers studied will include representatives of shade trees and shrubs.

Two small texts will be provided; more comprehensive treatises will be available. *Instructors:* Dr. N. H. Nickerson, Dr. Robert Dressler.

Course 103. Ferns of the St. Louis Area.

Place: Museum Bldg. *Time:* Five Thursday nights, 7:30 to 9:30 P. M., beginning April 28. *Fee:* $15 for the five sessions.

To the person interested in unusual

plants, ferns offer a unique opportunity; with relatively little effort, one may become acquainted with all species native to a particular region. This course includes some details of fern structure and life history, methods of recognition of species native to the area, and observations on environmental situations in which individuals of the various species may be found and grown in living collections. One class meeting will be a field trip to the Garden's Arboretum at Gray Summit on an afternoon to be mutually arranged. No previous knowledge of ferns is required. *Instructor:* Dr. George Bunting.

Horticulture

Course 122. Spring Horticulture.

Place: Museum Bldg. *Time:* (Register for only ONE of the sections offered.)

Section I. Wednesday afternoons, 1:00 to 4:00 P. M., March 16, 23, April 6, 13, 20.

Section II. Friday mornings, 9:00 A. M. to 12:00 Noon, March 18, 25, April 8, 15, 22.

Section III. Monday afternoons, 1:00 to 4:00 P. M., March 21, 28, April 11, 18, 25.

Section IV. Tuesday nights, 7:00 to 10:00 P. M., March 22, 29, April 12, 19, 26.

Fee: $18 for five meetings. *Enrollment:* Each section is limited to 20 students.

This course will teach beginning gardeners how to propagate plants from seed. Special emphasis is placed on annuals and perennials. Each session will include a lecture period and a practice period. The lectures will discuss factors affecting plant growth and practical means for their control, such as optimum supply of heat, light, moisture, air, fertilizer, lime, mulch, pest and disease control. Each student will receive seeds and four metal flats with sterilized soil. There will be enough space to grow 300–350 seedlings which, with the flats, may be taken home. Seeds of those plants particularly desired by a student should be brought to the first session. *Instructors:* Mr. Clarence Barbre, Mr. Kenneth Peck.

Orchid Culture

Course 141. Orchid Culture in Home and Greenhouse.

Place: Museum Bldg. *Time:* (Register for only ONE of the sections offered.)

Section I. April 16, 10:00 A. M.

Section II. April 23, 10:00 A. M.

Fee: $10 for one meeting. *Schedule:*

10:00 A. M.: Orchids suitable for home culture and the best ways of growing them. Potting demonstrations.

12:00 Noon: Lunch. Garden supplies coffee and soda.

1:00 P. M.: Growing orchids in unusual containers in the home. Basket slabs, poles, and the like, with examples and demonstrations of potting and care.

2:00 P. M.: Inspection of greenhouses.

3:00 P. M.: Individual potting instruction by members of Orchid Department staff. Students may take potted plants home.

Instructor: Mr. Robert J. Gillespie.

BOARD OF TRUSTEES

ROBERT BROOKINGS SMITH, President
LEICESTER B. FAUST, Vice-President
HENRY B. PFLAGER, Second Vice-President

HOWARD F. BAER
DANIEL K. CATLIN
SAM'L. C. DAVIS
HENRY HITCHCOCK
JOHN S. LEHMANN
ROBERT W. OTTO
WARREN MCKINLEY SHAPLEIGH

EX-OFFICIO MEMBERS

H. LEE BRUNS
GEORGE L. CADIGAN
STRATFORD LEE MORTON
ETHAN A. H. SHEPLEY
RAYMOND R. TUCKER

HONORARY TRUSTEE

DUDLEY FRENCH

OSCAR E. GLAESSNER, Secretary and Controller

WALDO G. FECHNER, Assistant Controller

HORTICULTURAL COUNCIL

Clifford W. Benson, Paul Bernard, Mrs. Paul H. Britt, E. G. Cherbonnier, Philip A. Conrath, Carl Geibel, Robert E. Goetz, Paul Hale, Earl Hath, Mrs. Hazel L. Knapp, Dan O'Gorman, Gilbert Pennewill, Mrs. T. Randolph Potter, F. R. McMath, Chairman.

STAFF

Frits W. Went.....Director
Hugh C. Cutler.....Executive Director
Edgar Anderson.....Curator of Useful Plants
Henry N. Andrews.....Paleobotanist
Clarence Barbre.....Instructor
Louis G. Brenner.....Arborist and Grounds Superintendent
George S. Bunting.....Taxonomist
Ladislaus Cutak.....Horticulturist and Greenhouse Superintendent
Josephine L. Davies.....Assistant in Education
Carroll W. Dodge.....Mycologist
Robert L. Dressler.....Taxonomist and Editor of ANNALS
John D. Dwyer.....Research Associate
E. L. Evinger.....Horticulturist and Editor of BULLETIN
Robert J. Gillespie.....In charge of Orchids
Paul A. Kohl.....Floriculturist
Emmet J. Layton.....Landscape Architect
Virginia McMahon.....Library Secretary
Viktor Muehlenbachs.....Research Associate
Norton H. Nickerson.....Morphologist
Lillian Overland.....Research Assistant
Dorothy Panos.....Friends of the Garden Secretary
Kenneth O. Peck.....In charge of Visitors' Activities
George H. Pring.....Superintendent
Kenneth A. Smith.....Engineer
Julian A. Steyermark.....Research Associate
Frank Steinberg.....Superintendent of the Arboretum, Gray Summit
George B. Van Schaack.....Librarian and Curator of Grasses
Trifon von Schrenk.....Associate Curator of the Museum
Robert E. Woodson, Jr.....Curator of Herbarium

SOME FACTS ABOUT SHAW'S GARDEN

The Missouri Botanical Garden (the official name chosen by Mr. Shaw) carries on the garden established by Henry Shaw over a century ago at TOWER GROVE, his country home. It is a private institution and has no support from city or state. The old stone walls and cast-iron fences, the Linnaean House, the Museum, the Mausoleum, and the TOWER GROVE mansion all date from Mr. Shaw's time. Since his death, as directed in his will, the Garden has been in the hands of a Board of Trustees who appoint the Director.

The Garden is open every day in the year (except New Year's and Christmas) from nine A. M. until seven P. M. spring to fall and until six in the winter time though the greenhouses close at five. TOWER GROVE, itself, Mr. Shaw's old country home, is open from one until four, admission fifty cents, with special guides. The Garden is nearly a mile long and has several entrances. The Main Entrance, the one most used by the general public, is at Tower Grove and Flora Place on the Sarah bus line (No. 42). The Park Southhampton buses (No. 80), direct from downtown, pass within three blocks of this entrance and stop directly across the street from the Administration Building at 2315 Tower Grove Avenue. The latter is the best entrance for students, visiting scientists, etc. It is open to such visitors after 8:30 A. M., but is closed on Saturdays, Sundays, and holidays. The Cleveland Ave. gate, 2221 Tower Grove, is nearly always open, and there is a service entrance on Alfred Avenue, one block south of Shaw Avenue.

Since Mr. Shaw's time an Arboretum has been developed at Gray Summit, Mo., State Highway 100 adjacent to Interstate Highway 44. It is open every day in the year and has auto roads as well as foot trails through the wild-flower reservation. There is a pinetum and an extensive display of daffodils and other narcissi which are at their best in April.